

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103**

SUBJECT: Risk-Based Concentration Table

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TO: RBC Table Users

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This memo concerns the Fall 2008 update of the EPA Region III Risk-Based Concentration (RBC) Table. The Table and its supporting documents have typically been posted at <http://www.epa.gov/reg3hwmd/risk/human/index.htm>.

The Table was originally developed to support the Superfund risk assessment screening process. Region III toxicologists have used RBCs to screen sites not yet on the National Priorities List, respond rapidly to citizen inquiries, and spot-check formal baseline risk assessments. The primary use of RBCs is for chemical screening during baseline risk assessment (see EPA Regional Guidance EPA/903/R-93-001, "Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening"). The exposure equations that served as the basis for the RBCs came from EPA's Risk Assessment Guidance for Superfund (RAGS), while the exposure factors were those recommended in RAGS or supplemental guidance from the Superfund program. The supplemental Technical Background Document provided specific equations and assumptions.

The Table has typically been updated in the spring and fall of each year, to incorporate updated toxicity factors and occasional updates to Superfund risk guidance. In Spring 2008, Region III began to rely for its updates on the Regional Screening table developed by Oak Ridge National Laboratory under an Interagency Agreement with EPA. The Regional Screening table is also accompanied by a calculator, which is discussed in more detail below.

Today's memo accompanies the Fall 2008 update of the Regional Screening Table. The Fall update includes corrections of minor errors and discrepancies discovered in the Spring 2008 beta version, and updated toxicity factors that have come to our attention during the past three and a half months.

ABOUT THE REGIONAL SCREENING TABLE

The Regional Screening table was developed with input from Regions III, VI, and IX, three Regions that have historically had their own versions of RBC Tables (also called PRG Tables), in an effort to improve consistency and incorporate updated guidance. Region III

believes that the resulting effort serves the same function as previous versions of the Region III RBC Table.

The Regional Screening table should be used in the same way that the Region III RBC Table has been used. When screening Region III sites in accordance with the 1993 Regional Guidance, "Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening," a Hazard Quotient (HQ) of 0.1 is used for noncarcinogens to account for additive effects. This adjustment should be applied by the user to the Screening Levels (SLs) on the Regional Screening table, which displays SLs at an HQ of 1, as the Region III RBC Table did. Also, just as the Region III RBC Table did not represent cleanup levels in most cases, the Regional Screening table does not typically represent cleanup levels. Rather, cleanup levels are determined on a case-by-case basis, in accordance with the criteria listed in the NCP.

Users will notice that many of the equations, inputs, and SLs in the Regional Screening table are the same as in the previous versions of the Region III RBC Table. The biggest differences between the 2008 Regional Screening Table and the 2007 RBC Table are summarized below. Note that these issues have not changed from Spring 2008 to Fall 2008.

Route-to-Route Extrapolation. As noted in the Spring 1998 RBC Table update, extrapolation of inhalation toxicity factors for oral factors was discontinued in Region III ten years ago. Oral-to-inhalation extrapolation, while not optimal due to uncertainty, was continued due to the scarcity of inhalation factors. However, with the increasing availability of Tier III toxicity values, oral-to-inhalation extrapolation has now been discontinued as well.

Incorporation of Inhalation and Dermal Exposure in Soil SLs. The Region III RBC Table relied on the oral exposure route for soil; oral exposure was generally expected to be the dominant exposure route. The omission of the dermal and inhalation routes (inhalation from volatile emissions and particulates) was an acknowledged source of uncertainty. The dermal and inhalation pathways have now been included in the Regional Screening table.

Inhalation Toxicity Factors. Reference Concentrations (RfCs) and Inhalation Unit Risks (IURs) were converted to Reference Doses (RfDs) and Cancer Slope Factors (CSFs) in previous versions of the Region III RBC Table. This was initially done because risk equations once relied upon RfDs and CSFs in units of mg/kg/day and 1/mg/kg/day, respectively. However, as the inhalation guidance has evolved, RfCs and IURs, in units of mg/m³ and m³/ug respectively, have become the recommended toxicity factors. Because the particular scenarios used in the Region III RBC Table would not have yielded significantly different results using RfDs/CSFs vs. RfCs/IURs, the Region III Table retained RfDs/CSFs for some time as a matter of convenience. However, with this update, the RfCs and IURs are now shown instead.

Industrial Air. The Regional Screening table includes an additional scenario that was not previously shown on the Region III RBC Table: inhalation of air by an industrial worker, using worker exposure factors. While this may be useful at some industrial sites, Region III data users are reminded that Superfund sites should evaluate future scenarios as well as current scenarios.

Fish Consumption. The generic Regional Screening table does not include a fish consumption pathway. However, to generate fish-tissue screening levels consistent with those previously shown on the Region III RBC Table, the Regional Screening calculator may be run for the fish tissue scenario in default mode. That yields a list which may be found here on the Region III website. (Note that the online list is very long, and we recommend that you view it online rather than printing the full list.) The default fish consumption rate is 54 g/day. To screen for populations with different consumption rates (e.g., subsistence fishers), consult with your regional risk assessor to determine whether an adjustment to the fish consumption rate (and subsequent generation of site-specific screening levels by the calculator) is warranted.

Soil-to-Groundwater Soil Screening Levels (SSLs). The soil-to-groundwater migration SSLs are shown at a dilution-attenuation factor (DAF) of 1. To screen at a site-specific DAF, simply multiply the SSL by the DAF. The SSLs are shown for two different target groundwater concentrations: the Maximum Contaminant Level (MCL) and the default tapwater screening level. The MCL may be important for certain regulatory decisions, while the tapwater screening level is likely to be important for risk-based decisions, such as findings of protectiveness. Therefore, both are shown. The risk-based number is expected to be the SSL of choice for initial screening at Region III sites; however, if there are any questions about this, consult your regional risk assessor.

Trichloroethene (TCE). TCE does not currently have EPA consensus toxicity factors. The Region III RBC Table incorporated the high-end values from EPA's 2001 Draft Assessment, because screening levels are generally intended to be conservative and protective. The Regional Screening table uses California EPA toxicity factors, following the Superfund hierarchy for toxicity values. However, it may be appropriate to consider multiple estimates of TCE risk, and the calculator may be used to generate alternate screening levels for TCE. Users are cautioned that both cancer and noncancer risk should be considered for TCE, particularly when cancer risks in the upper end of EPA Superfund's 1E-6 to 1E-4 risk range are being considered. Generally, however, screening is conducted at the 1E-6 risk level. Consult your regional risk assessor with any questions about evaluating TCE at Region III sites.

Toxicity Factors. The Regional Screening table includes updated toxicity factors; such updates have always been included in revisions to the Region III RBC Table. However, the Regional Screening table includes a wider variety of Tier III toxicity factors, and does not include National Center for Environmental Assessment (NCEA) issue papers unless they are currently supported by NCEA's Superfund Technical Support Center (STSC).

USING THE REGIONAL SCREENING TABLE

The Regional Screening table is generally used in the same manner as the Region III RBC Table. Except where noted above, the same national and regional guidance, the same uncertainties and limitations, and the same basic intended uses apply to this update as to previous versions of the Region III RBC Table. It is Region III's general expectation that the Fall 2008 Regional Screening table essentially serves as the Fall 2008 update to the Region III RBC table.

USING THE REGIONAL SCREENING CALCULATOR

The Regional Screening calculator allows the user to generate site-specific screening levels by adjusting the inputs to the equations. Possible uses for the calculator include but are not limited to: situations not covered by the default inputs and the generic table; generation of bounding or other multiple estimates of SLs; demonstrations of the sensitivity of different inputs; accommodations of state values or ARARs. To use the calculator, consult with your regional risk assessor. Any non-default SLs generated by the calculator should be accompanied by a discussion highlighting the site-specific inputs that were used, and the sources and rationale for those inputs.

CONTACT INFORMATION

For technical difficulties with the Regional Screening table or calculator, or for questions about the content of the table or calculator, follow the links on the web page from which the Regional Screening Tables are downloaded. For technical difficulties with this Region III website, contact uebele.charles@epa.gov. For questions about using the Regional Screening table or calculator at Region III sites, please consult your regional risk assessor, or you can reach me at hubbard.jennifer@epa.gov or 215-814-3328.